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| 10/702,095 | 11/05/2003 | Brian T. Donovan | LIGH1110-1 | 6814 |

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| EXAMINER | |
|---|---|
| HINES, ANNE M | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/702,095 | DONOVAN ET AL. | |
| | Examiner | Art Unit | |
| | Anne M. Hines | 2879 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2,4-11 and 16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8* is/are allowed.

6)☒ Claim(s) *1,2,4-7,9-11 and 16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 November 2003 and 08 August 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

The amendment filed on August 8, 2007, has been entered and acknowledged by the Examiner. The amendment to the drawings filed August 8, 2007 overcomes the objection to the drawings.

Claims 1-2, 4-11, and 16 are pending in the instant application.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4-5, 7, 9, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Shoji et al. (US 6683418).

Regarding claim 1, Shoji discloses a method, comprising emitting an optical signal from a gas plasma that is RF inductively coupled to an integrated circuit including a gas plasma discharge device having an inductive coil (Fig. 2; Column 1, lines 8-35; Column 3, line 23 to Column 4, line 8), and modulating data using at least one pulse width modulation technique selected from the group consisting of pulse position modulation, and pulse width modulation, wherein emitting is controlled at least in part by

pulse modulated data (Column 3, line 23 to Column 4, line 8; Fig. 6a-6c; Fig. 8; Column 5, lines 34-41; Column 7, line 33 to Column 8, line 34), wherein emitting includes magnetically energizing the inductive coil with the integrated circuit to induce a discharge from the gas plasma (Column 1, lines 8-35).

Regarding claim 2, Shoji further discloses wherein the integrated circuit includes an oscillator and magnetically energizing the inductive coil with the integrated circuit to induce a discharge from the gas plasma (Column 1, lines 8-35; Column 3, line 23 to Column 4, line 8).

Regarding claim 4, Shoji further discloses capacitively energizing at least one member selected from the group consisting of a first capacitive coupling plate and a second capacitive coupling plate with the integrated circuit to facilitate the discharge from the gas plasma (Fig. 2, 43; Column 4, lines 9-13).

Regarding claim 5, Shoji further discloses wherein magnetically energizing the inductive coil includes the use of a differential drive to increase power (Fig. 7; Column 6, line 22 to Column 7, line 32).

Regarding claim 7, Shoji further discloses applying an RF bias to the gas plasma and maintaining the RF bias to affect switch-on time of the gas plasma (Figs. 6a-6c).

Regarding claim 9, Shoji further discloses refracting the optical signal with an optically conductive layer that is optically coupled to the gas plasma (Column 1, lines 8-21, 'tube').

Regarding claim 16, Shoji further discloses wherein the gas plasma discharge device includes a first capacitive coupling plate and a second capacitive coupling plate (Fig. 2, 43).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shoji et al. (US 6683418) in view of Lapadula et al. (US 4211834).

Regarding claim 6, Shoji teaches the invention of claim 1, but is silent regarding the method of manufacturing the circuitry of the control system disclosed.

In the same field of endeavor of the process of manufacturing integrated circuits, Lapadula teaches wherein the substrate of an integrated circuit is treated with actinic radiation in order to reduce the size and thereby increase the speed of an integrated circuit through the method of patterning of a resist layer (Column 1, lines 17-49).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Shoji to have the circuitry of Shoji formed through the method of Lapadula, including exposing the circuitry to actinic radiation, in order to reduce the size and thereby increase the speed of an integrated circuit through the method of patterning of a resist layer.

Claims 1 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hug et al. (US 4230902) in view of Willett (US 3798568) and Huang et al. (US 2003/0210409).

Regarding claims 1 and 10, Hug teaches a laser module for a laser printer including a method comprising emitting an optical signal from a plasma tube (Fig. 3, 34; Column 5, lines 50-51) that is coupled to an integrated circuit (Fig. 3, 46; Column 5, line 54) including a gas plasma discharge device, and further comprising wherein the optical signal is diffracted with an acousto-optic crystal that is optically coupled to the gas plasma (Fig. 3, 52; Column 5, lines 59-60). Hug is silent regarding the structure of the electrodes of the plasma tube. Hug is also silent regarding the method of driving the laser of the laser printer module.

In the same field of endeavor, Willett teaches a plasma tube (Fig. 1; Abstract) with an inductive coil (Fig. 1, 26; Column 2, line 42) wherein emitting includes magnetically energizing the inductive coil to induce a discharge from the gas plasma (Column 1, line 65 to Column 2, line 4) in order to form a laser that eliminates electrodes and thereby prevent contamination of the plasma (Column 2, line 66 to Column 3, line 2).

In the same field of endeavor of laser printer laser operation, Huang teaches modulating the duration of a laser pulse in a laser printer using a pulse width modulation technique in order to control the appearance of pixels on the printed article (Page 1, Paragraph [0011]).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Hug to have the plasma tube laser of Willett including a plasma tube with an inductive coil whereby emitting includes magnetically energizing the inductive coil to induce a discharge from the gas plasma in order to form a laser that eliminates electrodes and thereby prevent contamination of the plasma, as disclosed by Willett. It further would have been obvious to one of ordinary skill in the art to modify the invention of Hug and Willet to have the laser of the laser printer module modulated by pulse width modulation in order to control the appearance of pixels on the printed article, as disclosed by Huang.

Claims 1 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abshire (US 4600299) in view of Silfvast et al. (US 4388720).

Regarding claims 1 and 11, Abshire teaches a method comprising emitting an optical signal from a gas plasma laser with a resonant cavity coupled to an integrated circuit including a gas plasma discharge device (Fig. 1, 12 & 20; Abstract) including broadcasting modulated data to a plurality of optical detectors (Fig. 1, 28 & 52; Abstract). Abshire is silent regarding the electrode structure of the gas plasma laser. Abshire is also silent regarding the method of driving the power supply of the laser.

In the same field of endeavor, Silfvast teaches a gas plasma laser with a resonant cavity wherein the gas plasma laser has an inductive coil and emitting includes magnetically energizing the inductive coil with the integrated circuit to induce a discharge from the gas plasma (Fig. 8; Column 5, lines 13-25) and wherein a high

power output of the laser is attributed to the excitation pulse curve used to drive the laser that results from a pulse width modulated signal (Column 3, line 37 to Column 4, line 14) in order to provide a laser that has a high power and can provide immediate laser output (Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Abshire to have the gas plasma laser with a resonant cavity of Silfvast including wherein the gas plasma laser has an inductive coil and emitting includes magnetically energizing the inductive coil with the integrated circuit and wherein a high power output of the laser is attributed to the excitation pulse curve used to drive the laser that results from a pulse width modulated signal in order to induce a discharge from the gas plasma in order to provide a laser that has a high power and can provide immediate laser output, as disclosed by Silfvast.

***Allowable Subject Matter***

Claim 8 is allowed.

Regarding independent claim 8, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 8, and specifically comprising the limitation wherein a method of emitting an optical signal from a gas plasma that is inductively coupled to an integrated circuit including a gas plasma discharge device having an inductive coil and wherein the gas plasma is located between the integrated circuit and the optically and electrically conductive layer,

wherein emission includes magnetically energizing the inductive coil with the integrated circuit to induce a discharge from the gas plasma.

***Response to Arguments***

Applicant's arguments filed August 8, 2007 have been fully considered but they are not persuasive.

With regard to the rejection of claim 1 over the Shoji reference, Applicant argues that Shoji fails to disclose the limitation wherein pulse modulating data using at least one pulse modulation technique selected from the group consisting of pulse position modulation and pulse width modulation.

The Examiner respectfully disagrees. At Column 7, line 65 to Column 8, line 16 Shoji discloses changing the brightness of the lamp in accordance with conduction phase angle by measuring the conduction phase angle with a detection circuit and changing the on-duty of the switch by changing the resistance of a resistor based on the conduction phase angle. Changing the on-duty of the switch that provides power to the lamp constitutes control of the plasma by pulse width modulation.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anne M Hines
Patent Examiner
Art Unit 2879

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PRIMARY EXAMINER